Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

1. (Currently Amended) A process for forming a lubricative film for cold working on a metal substrate consisting essentially of a metal selected from the group consisting of carbon, aluminum, steel, and an austenitic stainless steel, said process comprising the following operations:

(I) bringing said metal substrate ~~that is devoid of titanium and titanium alloys~~ into contact with an aqueous electrolyte solution comprising water and:

(A) at least 20 g/l of dissolved zinc cations;

(B) at least 20 g/l of dissolved phosphate anions; and

(C) at least one dissolved auxiliary acid other than phosphoric acid, said auxiliary acid having at least a first ionization constant that is greater than the third ionization constant for phosphoric acid; and, optionally, other constituents as detailed further below,

this aqueous electrolyte also being in contact with a counter-electrode that is not said metal substrate to be cold worked, so that an electric current can pass through the counter-electrode as anode, the aqueous electrolyte solution by ionic conduction, and said metal substrate as cathode;

(II) passing through said metal substrate while it remains in contact with said aqueous electrolyte solution an electric current that has a net cathodizing character at said metal substrate for a sufficient time to form an adherent solid phosphate conversion coating having 6-20 gm of film per square meter of metal substrate over said metal substrate without generating sludge;

(III) discontinuing contact between said aqueous electrolyte solution and said metal substrate bearing said adherent solid phosphate conversion coating; and

(IV) applying to the exterior surface of said solid phosphate conversion coating, when it is not in contact with said aqueous electrolyte solution, a water- or oil-based lubricant coating,

the aqueous electrolyte solution having a pH value at least as low as the pH value of a hypothetical reference electrolyte solution that contains the same actual amounts of dissolved zinc and phosphate ions as does said aqueous electrolyte solution and in addition contains at least 30 g/l of nitric acid as its only auxiliary acid;

at least one type of divalent or trivalent metal ions selected from a group consisting of magnesium, aluminum, manganese, chromium, iron, nickel, and copper; and

a concentration of calcium ions such that the molar ratio of calcium ions to zinc ions is from 0.1:1 to 2:1.

2-4. (Cancelled)

5. (Currently Amended) A process according to claim [[4]] 1, wherein before operation (I), said substrate is acid pickled and then rinsed with water.

6. (Original) A process according to claim 5, wherein after being acid pickled and rinsed with water, said substrate is brought into contact with a surface conditioning liquid containing colloidal titanium, dispersed metal phosphate particles including particles with a diameter of 5μm or less, or both colloidal titanium and dispersed metal phosphate particles with a diameter of 5μm or less.

7. (Original) A process according to claim 6, wherein the lubricant coating applied in operation (IV) is a water-based lubricant that comprises at least one type of lubricant substance selected from the group consisting of dissolved alkali metal salts of fatty acids, dispersed metallic soaps. and dispersed solid lubricants.

8. (Original) A process according to claim 6, wherein the lubricant coating applied in operation (IV) is an oil-based lubricant that comprises at least one type of lubricant substance selected from the group consisting of mineral oils, animal oils, and synthetic ester oils.

9-10. (Cancelled)

11. (Currently Amended) A process according to claim [[10]] 1, wherein before operation (I), said substrate is acid pickled and then rinsed with water.

12. (Original) A process according to claim 11, wherein after being acid pickled and rinsed with water, said substrate is brought into contact with a surface conditioning liquid containing colloidal titanium, dispersed metal phosphate particles including particles with a diameter of 5μm or less, or both colloidal titanium and dispersed metal phosphate particles with a diameter of 5μm or less.

13. (Original) A process according to claim 12, wherein the lubricant coating applied in operation (IV) is a water-based lubricant that comprises at least one type of lubricant substance selected from the group consisting of dissolved alkali metal salts of fatty acids, dispersed metallic soaps, and dispersed solid lubricants.

14. (Original) A process according to claim 12, wherein the lubricant coating applied in operation (IV) is an oil-based lubricant that comprises at least one type of lubricant substance selected from the group consisting of mineral oils, animal oils, and synthetic ester oils.

15. (Original) A process according to claim 1, wherein before operation (I), said substrate is acid pickled and then rinsed with water.

16. (Original) A process according to claim 15, wherein after being acid pickled and rinsed with water, said substrate is brought into contact with a surface conditioning

liquid containing colloidal titanium, dispersed metal phosphate particles including particles with a diameter of 5μm or less, or both colloidal titanium and dispersed metal phosphate particles with a diameter of 5μm or less.

17. (Original) A process according to claim 16, wherein the lubricant coating applied in operation (IV) is a water-based lubricant that comprises at least one type of lubricant substance selected from the group consisting of dissolved alkali metal salts of fatty acids, dispersed metallic soaps, and dispersed solid lubricants.

18. (Original) A process according to claim 16, wherein the lubricant coating applied in operation (IV) is an oil-based lubricant that comprises at least one type of lubricant substance selected from the group consisting of mineral oils, animal oils, and synthetic ester oils.

19. (Original) A process according to claim 1, wherein before operation (I), said substrate is brought into contact with a surface conditioning liquid comprising colloidal titanium, dispersed metal phosphate particles including particles with a diameter of 5μm or less, or both colloidal titanium and dispersed metal phosphate particles with a diameter of 5μm or less.

20. (Original) A process according to claim 19, wherein the lubricant coating applied in operation (IV) is a water-based lubricant that comprises at least one type of lubricant substance selected from the group consisting of dissolved alkali metal salts of fatty acids, dispersed metallic soaps, and dispersed solid lubricants.

21. (Original) A process according to claim 19, wherein the lubricant coating applied in operation (IV) is an oil-based lubricant that comprises at least one type of lubricant substance selected from the group consisting of mineral oils, animal oils, and synthetic ester oils.

22. (Currently Amended) A process for forming a lubricative film for cold working on a metal substrate consisting essentially of a metal selected from the group consisting of carbon, aluminum, steel, and an austenitic stainless steel, the process comprising the following operations:

(I) bringing the metal substrate ~~that is devoid of titanium and titanium alloys~~ into contact with an aqueous electrolyte solution comprising water and;

(A) at least 20 g/l of dissolved zinc cations;

(B) dissolved phosphate anions; and

(C) at least one dissolved auxiliary acid other than phosphoric acid, the auxiliary acid being present in an amount of at least 30 g/l and having at least a first ionization constant that is greater than the third ionization constant for phosphoric acid; and, optionally, other constituents as detailed further below,

this aqueous electrolyte also being in contact with a counter-electrode that is not the metal substrate to be cold worked, so that an electric current can pass through the counter-electrode as anode, the aqueous electrolyte solution by ionic conduction, and the metal substrate as cathode;

(II) passing through the metal substrate while it remains in contact with the aqueous electrolyte solution an electric current that has a net cathodizing character at the metal substrate for a sufficient time to form an adherent solid phosphate conversion coating having 6-20 gm of film per square meter of metal substrate over the metal substrate without generating sludge;

(III) discontinuing contact between the aqueous electrolyte solution and the metal substrate bearing the adherent solid phosphate conversion coating; and

(IV) applying to the exterior surface of the solid phosphate conversion coating, when it is not in contact with the aqueous electrolyte solution, a water- or oil-based lubricant coating.

23. (Previously Added) A process according to claim 22 wherein the auxiliary acid is nitric acid.

24. (Previously Added) A process according to claim 23 wherein the aqueous electrolyte solution in operation (I) comprises [at least 20 g/l of dissolved zinc cations and] at least 20 g/l of dissolved phosphate anions.

25. (Currently Amended) A process for forming a lubricative film for cold working on a metal substrate consisting essentially of a metal selected from the group consisting of carbon, aluminum, steel, and an austenitic stainless steel, said process comprising the following operations:

(I) selecting said metal substrate from the group ~~consisting of ferrous materials, aluminum, magnesium and copper,~~ and bringing said substrate into contact with an aqueous electrolyte solution comprising water and:

(A) at least 20 g/l of dissolved zinc cations;

(B) at least 20 g/l of dissolved phosphate anions; and

(C) at least one dissolved auxiliary acid other than phosphoric acid, said auxiliary acid having at least a first ionization constant that is greater than the third ionization constant for phosphoric acid; and, optionally, other constituents as detailed further below,

this aqueous electrolyte also being in contact with a counter-electrode that is not said metal substrate to be cold worked, so that an electric current can pass through the counter-electrode as anode, the aqueous electrolyte solution by ionic conduction, and said metal substrate as cathode;

(II) passing through said metal substrate while it remains in contact with said aqueous electrolyte solution an electric current that has a net cathodizing character at said metal substrate for a sufficient time to form an adherent solid phosphate conversion coating having 6-20 gm of film per square meter of metal substrate over said metal substrate without generating sludge;

(III) discontinuing contact between said aqueous electrolyte solution and said metal substrate bearing said adherent solid phosphate conversion coating; and

(IV) applying to the exterior surface of said solid phosphate conversion coating, when it is not in contact with said aqueous electrolyte solution, a water- or oil-based lubricant coating,

the aqueous electrolyte solution having a pH value at least as low as the pH value of a hypothetical reference electrolyte solution that contains the same actual amounts of dissolved zinc and phosphate ions as does said aqueous electrolyte solution and in addition contains at least 30 g/l of nitric acid as its only auxiliary acid;

at least one type of divalent or trivalent metal ions selected from a group consisting of magnesium, aluminum, manganese, chromium, iron, nickel, and copper; and

a concentration of calcium ions such that the molar ratio of calcium ions to zinc ions is from 0.1:1 to 2:1.